Finding 27 -- The State operates multiple telecommunications networks.

There are multiple networks serving various State entities. These networks are planned and managed separately to support their separate user communities. As a result, the networks have only limited interconnectivity, some of which has been difficult to effect. There is also duplication of effort in planning, implementing, operating, and maintaining these networks, as well as duplication of costs.

North Carolina currently operates and pays for at least three physically distinct telecommunications networks. They are operated by:

- State Telecommunications Service
- Administrative Office of the Courts
- University of North Carolina

The State also pays for the following six independent network management functions.

- State Telecommunications Service
- Administrative Office of the Courts
- Department of Justice
- Department of Public Instruction
- University of North Carolina
- Microelectronics Center of North Carolina

STS runs the statewide backbone network at an annual direct cost of approximately $13.5 million. Its annual network management costs are approximately $2 million. Although financial statements for the other networks were not obtained, it appears likely that these networks, including STS, collectively cost the State at least $20 to $30 million annually.

From a network management standpoint, multiple overlapping networks are:

- **Technology constrained.** Concurrent development efforts on multiple independent networks reduce the State's leverage with the vendor community. The State's objective is to obtain the best possible implementation of new technologies from the vendors. However, the State's requirements are divided, and the vendors' initiatives are diluted across the multiple networks. An example with Southern Bell is the push for band-

width on demand versus an expanded fixed network. The overall effect is a significant lack of synergy.

- **Resource constrained.** The technical staff required to manage a network is a scarce resource. Although some of the networks are much smaller than others, each still requires some technical staff to perform essentially equivalent network management functions. As a result, the State's total demand for this scarce resource is relatively high. Since the networks are run independently, there is minimal opportunity to leverage these resources.

- **Information constrained.** Data base integration is more difficult with physically separate networks; logical data base integration is required in place of physical integration. To a degree, information sharing is restricted if the network is not centrally managed.

Recommendation -- The State should plan and implement some beneficial consolidation of these networks.

North Carolina should immediately undertake a statewide planning process to determine the most advantageous approach to achieving service improvements, management efficiencies, and cost-effectiveness through an appropriate consolidation of these various networks under a central authority.

By centralizing current usage and effectively managing and optimizing the network, the State could reduce its direct network costs by as much as 20 percent. This is the degree of comparable savings that other large telecommunications clients have achieved. Further potential savings could be realized through reduction of multiple, decentralized resources that currently manage these networks.

Consolidation of the networks under a central authority means:

- End users should see only a single network, regardless of the origin, destination, and application (voice, data, video) of their transmissions. The network should function as a seamless web capable of connecting users anywhere across the State.

- The physical networks may be combined to an extent dictated by available cost reductions. Since the resulting network still has to satisfy all of the State's current and anticipated needs, components of the current networks may be retained and interconnected, not eliminated.

- The management of the current networks would be coordinated to support the objective of the seamless web, and may be combined to some extent to achieve cost reductions.

STS is an obvious candidate to be the central authority to operate the consolidated network. However, the State needs to give this decision careful consideration. STS, in its current organizational position as part of SIPS, is tied heavily and appropriately to the State Computer Center. The user community for a consolidated statewide network in the future will be substantially broader and more diverse than at present. If STS were to take on this expanded role, its organizational relationship to SIPS should be evaluated and altered if necessary so that the State Computer Center would become just another of its clients. This same issue also needs to be addressed at the IRMC level.

Finding 28 -- The STS' telecommunications disaster recovery plan is not operational at this time.

STS has prepared a draft telecommunications disaster recovery plan. It addresses items such as:

- Disaster scenario and the services affected
- Resulting alert levels
- Recovery actions for each alert for the three stages of a disaster: response, recovery, and restoration
- Recovery team organization, responsibilities, responsible individuals and telephone numbers
- Key State agency points of contact
- Key vendor telephone numbers

The plan is a starting point, but it is not currently operational and is inadequate in the following areas:

- No objectives or time frames have been set for the recovery of the network, nor have priorities been given for the reestablishment of network components.
- Actions to be taken under the three phases of the disaster recovery are described superficially and need to be more specific as to what will need to be done, by whom, and in what time frame.
- There are no discussions of the back-up capability that is expected. If STS is depending on AT&T and other vendors to have back-up or alternative circuits available, these capabilities need to be explicitly documented with the vendor and in the plan.

- There is no test plan to verify that at least the disaster response and initial elements of recovery will work.

- The plan has no details concerning the network, network components, DCIs, or user locations and equipment that may need to be replaced.

Recommendation -- STS should enhance the draft telecommunication disaster recovery plan.

STS needs to enhance the plan, to correct these deficiencies, and to coordinate it with the SIPS data center disaster recovery plan.

State Information Processing Service

SIPS was formed and authorized under G.S. 143B-426.40. It operates within the Office of State Controller and under the oversight of the Information Technology Commission.

Its mission is to provide information technology resources on a shared cost basis to the executive branch agencies and institutions, excluding the Department of Justice and the University of North Carolina. SIPS provides the following types of functional services to its client agencies:

- Computer operations

- Telecommunications services, including voice and data

- Client support services, including system development and training

- IRM planning and policy support

SIPS is described in greater detail in Section 2.

The performance audit of SIPS has led to numerous recommendations, most of which are qualitative in nature. The performance audit also included a peer group comparison of the SIPS data center to other IBM mainframe data centers of similar size. The comparisons are primarily quantitative. The peer group results are presented in Appendix C. The recommendations are organized and presented in several key areas:

- Customer service

- Finances

- Disaster recovery

- Performance analysis and capacity management
- Internal management
- Technical leadership

Customer service

Finding 29 -- SIPS has been seen by its clients as operating with a non-responsive and sometimes authoritarian orientation.

Almost unanimously, client IRM managers indicated that they were dissatisfied with SIPS service. Their complaints especially related to the management attitude that they perceived as insensitive to their needs and interests and unresponsive to their requests.

According to its various clients, SIPS has (with cursory ITC approval when required):

- Issued policies without adequate consideration of some of the affected agencies' requirements
- Set billing rates that some agencies felt strongly were unbalanced and too high and lacked adequate consideration of some of the affected agencies' requirements
- Been reluctant to commit strong support for non-mainframe system solutions sought by its clients
- Been reluctant to commit to specific high level service goals for its client agencies
- Treated the approval process for a $9 million mainframe upgrade like any other major technology upgrade

It is important to note that SIPS' perspective on these same points is almost categorically opposite the view of its clients. This difference in perspective is just as much an issue as the individual points.

This finding also applies directly to STS. Several agencies, such as State Transportation, Public Instruction, Administrative Office of the Courts, and University of North Carolina, are not convinced that STS is properly meeting their telephone system needs in the most cost-effective manner. They perceive STS as tending to bypass working with the departments in determining their requirements and recommending Centrex as the solution for every problem. Centrex stands for Central Exchange, which means that the telephone switching equipment is physically located at the telephone company central office. STS also tends to make telephone equipment decisions on an individual request basis versus a broader divisional or departmental basis.

The Department of State Transportation serves as an example:

- The Division of Highways building alone has numerous different desktop phone systems because Centrex has not adequately satisfied user needs. Within that building, the Management Information Systems division has staff on several floors. They are split across three different phone systems. That means that the manager cannot reach many of his staff by dialing an extension, but has to make an outside call instead.

- The Division of Motor Vehicles (DMV) needs a new phone system and believes that a PBX would be the most effective and economical solution. PBX stands for Private Branch Exchange, which means that the telephone switching equipment is physically on-site, and the user operates it. DMV also believes that STS would not consider a PBX system and would require DMV to use Centrex.

Recommendation -- SIPS should proceed to implement fully the customer service orientation that it adopted in its January 1992 reorganization.

References to SIPS in this recommendation specifically address STS as well.

Notwithstanding its verbatim statutory authority, SIPS was clearly created to provide a service to its client agencies. It is also virtually totally supported by receipts from those agencies and can maximize its overall value to the State by providing responsive service to its clients. Thus it reasonably follows that SIPS should immediately proceed to implement fully its recently adopted customer service orientation. This means listening to every client, and working with each one to determine the most effective service that SIPS can provide to best serve its clients' business mission.

SIPS should strive to offer services that are competitive, or even superior, in quality and cost to equivalent services available from alternative sources. It essentially has a captive market, but it cannot afford to remain complacent. If SIPS is ever judged to be non-competitive, the General Assembly would probably be inclined to amend the enabling statute to protect the State's best interests. SIPS should periodically perform a competitive self-analysis to keep this objective in focus.

SIPS' quality is measured by its clients. Therefore, SIPS should regularly solicit both evaluations and advice from its clients and take action to continuously improve the quality of its services. This constitutes a Client Service Management Program. The program should be based on periodic polling of client satisfaction. The poll can be implemented as a simple questionnaire to be returned directly to the Chief of SIPS. There should be a personal follow-up back to the agency to confirm that SIPS is listening and is truly interested in the agency's opinion.

Finding 30 - SIPS does not have an effective client relations function.

Currently SIPS has one person assigned to the Client Relations function. This is a new function created as a result of the recent reorganization. There is no job description for the individual in this position, but she feels that her role needs to have both an internal and external focus:

- Internal

  Good business function
  Client orientation
  Client based policies

- External

  Liaison to clients
  Ability to address all client needs

Prior to the reorganization, SIPS had assigned responsibilities for client management to individual senior managers in the organization. At best, this responsibility was difficult for the managers to perform given the pressures of managing day-to-day operations. At worst, it was not totally successful, and in some cases actually contributed to the problem between some managers and their respective client agencies.

Recommendation -- SIPS should further broaden and strengthen the new client relations function.

This function should be expanded essentially into a client marketing function. It should include a new position of Account Representative with the sole responsibility for managing all SIPS services to assigned clients. These positions should be staffed with client-service oriented individuals. The role of the Account Representative would be to:

- Serve as the focal point for all SIPS services, including data processing, telecommunications, software development, and other information technology support

- Maintain frequent contact with client accounts, including monthly meetings with agency users and IRM management to review status and pending commitments of SIPS services to the agency

- Understand and anticipate the needs and requirements of the clients and explain them effectively to SIPS technical management

- Pursue client satisfaction through timely resolution of all client issues

The creation of account representatives will enable SIPS to raise the quality of client service in at least three ways:

- It will prevent clients from feeling ignored by SIPS and prevent their problems from appearing to fall between the cracks as they sometimes seemed to
- It will free SIPS senior managers to concentrate on their technical responsibilities and do the best possible job in support of quality client service
- It will provide SIPS management with the information necessary to plan and position its services and capabilities in line with foreseeable client needs

The current Manager of Client Relations should supervise this staff of approximately four to eight account representatives. Each account representative will have several agency accounts to manage. All requests for SIPS services (except direct calls for Help Desk support) will come through the account representative, who will work with the appropriate SIPS divisions to coordinate the delivery of services.

Finding 31 -- SIPS has been perceived as reluctant to negotiate and implement specific service level agreements.

The SIPS Advisory Board more than a year ago requested SIPS to establish Service Level Agreements (SLAs) with the agencies.

A Service Level Agreement is essentially a contract between a Data Center and its client that defines measurable service level goals that the Data Center commits to delivering. The SLA concept is almost 20 years old. Examples of such goals are:

- The on-line system will be available and operational at least 99.8 percent of the time during prime shift
- All problem reports will be acknowledged within 15 minutes
- All batch printed checks will be ready for mailing by 8 a.m. of the next business day

The performance measures reflect the client's critical needs. The performance goals reflect the Data Center's ability and commitment to manage its operations to provide the required services. The agreement also typically includes consequences for failure to meet the committed goals.

According to several IRM managers, SIPS was reluctant to make such a commitment. In January 1992, SIPS published a set of service level objectives that the agencies should expect, with a standing offer to negotiate additional service terms with each agency individually. Although only one department has acted on that offer to date, some of the

IRM managers believed that SIPS' objectives fell short of their expectations for an SLA; but they have accepted the objectives as a fallback position.

Recommendation -- SIPS should institute client-oriented performance measures and commit to them in service level agreements.

The Client Relations group, in conjunction with their clients and State Computer Center management, should develop a set of SIPS performance measures that the clients consider meaningful and that SIPS can reasonably measure. Each agency should set service level targets with SIPS and formalize them in Service Level Agreements. The account representatives should track and report on these performance statistics monthly, both to the clients and to SIPS management.

STS should similarly commit to service level targets with its client agencies.

Finding 32 -- SIPS' bills would be more useful if they presented information that enabled agencies to manage their associated costs and resources.

SIPS was aware that agencies had found its data processing bills difficult to read and understand, and early in 1992 it reformatted the bills to make them more readable. It also provided several billing analysis reports as well as the raw billing data that the agencies can analyze themselves. SIPS is currently in the process of redeveloping its billing system. However, some agencies continue to feel that the bills are too complex.

STS also provides regular monthly bills to the agencies for their network usage. The bills provide the necessary detail on usage, rates, and amounts. However, they do not contain information that agencies can easily use to analyze and manage their usage of the network.

The STS telephone system and network management software collects much more data than is used for billing. To assist agencies in managing their telephone usage, STS should give the agencies access to this call accounting data in a non-technical format. The agencies can then use the data to analyze peak demand periods, overall usage volume, and other patterns and trends.

Recommendation -- SIPS should simplify the structure of its billing process and the format of its billing reports.

This recommendation applies separately and equally to computing services and telecommunications services. The agencies' needs are similar for both types of service.

From the agency perspective, the bills need to satisfy at least two criteria:

- The agency should be able to verify the billings to a reasonable extent and with minimal effort

- The agency should be given monthly summary information about its utilization of resources that can help it to manage its personnel and costs

SIPS should pursue a course of action including the following four steps:

- Study alternative billing algorithms with the objective of simplifying the definitions of the service units and reducing the number of different types of billable service units

- In conjunction with the SIPS Advisory Board, the IRM Advisory Board, and selected users with special needs, define the agencies' requirements regarding bill format and information content

- Develop an implementable design for new billing reports, based on the best technical choice among software billing packages, public domain software from other states, and custom software

- Review the proposed design with a cross-section of agencies to obtain consensus before committing to a specific implementation. Some agencies may also require specially formatted reports to assist them in accomplishing their business missions

Finances

Finding 33 -- SIPS' billing rates have been developed informally.

Formulas for computation of SCC's billing rates have customarily been set by the Director of the State Computer Center, reportedly without sufficient financial analysis and without the participation of SIPS' accountant. Rate adjustments have typically been downward, so the ITC's review prior to approval has been cursory.

In 1991, SCC rates generated approximately $25 million in gross receipts from the agencies, which exceeded direct current operating costs by approximately $9 million or 36 percent. The billing rates were developed to create this incremental revenue to contribute to the reserve fund necessary to finance the expected upgrade to the mainframe computer. However, at these levels, the rate process should be more formal and the rates should be scrutinized before approval.

Recommendation -- SIPS should formalize its rate setting and review process for computing and telecommunications services.

For both computing and telecommunications services, SIPS should take the following steps in developing its billing rates:

- Develop a financial model of billing receipts based on service unit types, estimated usage levels, and proposed billing rates. The development of such a model is a one-time effort.

  With appropriate accounting support, use the model to project receipts by service unit, type, and agency, and also reserve accumulation. Analyze the impact of alternative rate change scenarios on the agencies and on SIPS' gross receipts and reserve.

- Present a written billing rate proposal to the SIPS Advisory Board, clearly indicating:

  Revenue objectives, including reserve accumulation

  Proposed rate changes

  Assumptions on service unit utilization by agency

  Anticipated financial impact by agency

  Anticipated financial impact on SIPS

  Conduct a review meeting to obtain consensus on the proposal, manipulating the model real-time to evaluate requested changes.

- Submit a complete final billing rate proposal to the IRMC, including pro forma SIPS financial statements with and without the proposed rate changes, and also including agency exceptions to the rate proposal.

Finding 34 -- SIPS' reserve accumulation will likely impact agencies that obtain federal reimbursements.

SIPS' revenues flow into an internal service fund, and its billing rates include accumulation of reserve funds in excess of current direct operating costs. Such a reserve is not eligible for reimbursement under OMB Circular A-87.

This has already caused a problem for the Employment Security Commission, which has been informed by the U.S. Department of Labor that it may owe several millions of dollars in repayment for prior-year reimbursements of ineligible expenses, namely, SIPS' billings for reserve accumulation. The State Controller has already intervened in an attempt to resolve this situation with the federal agents.

Other agencies that receive federal reimbursements, such as the Department of Human Resources, are likely to encounter the same problem in the future. According to the Spring 1992 issue of the NASIRE newsletter *Exchange*, the U.S. Department of Health & Human

Services has issued a directive (initially effective only in Region IV) related to Circular A-87 with the following effect:

> "For fiscal years beginning on or after July 1, 1992, internal service funds over/under charges will no longer be allowed as adjustments in each State's Statewide Cost Allocation Plan (SWCAP). Furthermore, internal service funds will not be permitted to include unallowable costs (interest expense) in their rates, to be later offset by SWCAP adjustments. The impact of these changes may be that State data centers will need to implement dual rate structures within their charge-back systems, and that they will need to monitor their rates and cost recoveries more closely."

This is not a minor issue, especially to the agencies that might be forced to make direct refunds to federal programs, and it is not likely to go away. SIPS should not have to endure a crisis change to its billing system. Since both potential problems are known, they should be dealt with now.

Recommendation -- The State Controller should work with the affected agencies to anticipate and minimize the adverse impact of this directive and of Circular A-87 in general.

Although the impact is of major significance, this is primarily a cost accounting issue, and only secondarily an issue of data center billing strategy and tactics. The State Controller should take the initiative on this issue because of the level of accounting expertise required. The State Controller should:

- Work with the controllers of the affected agencies and with federal agents to identify alternative financial approaches that would minimize potential problems with federal disallowances. For instance, if all unallowable costs (e.g., SIPS' reserve accumulation) were isolated in the billings, they could be easily deducted from the federal reimbursement claims. They would then remain to be paid by the agency with State appropriated funds instead of federal funds, which is the inevitable effect of the A-87 restrictions under any scenario.

- Present to SIPS the accounting requirements to be met by revisions to its billing methodology and its billing system.

- With the controllers of the affected agencies, review SIPS' proposal for the redesign of the billing methodology and system and approve it for implementation.